

### **AMENDMENT TO THE CLAIMS**

This listing of claims will replace all prior versions, and listings, of claims in the application.

1. (Currently amended) A vector comprising a nucleic acid sequence comprising:
  - a) a prokaryotic transposase gene operably linked to a first promoter, wherein the nucleic acid sequence 3' to the first promoter comprises the Kozak sequence as set forth in SEQ ID NO: 13, the Kozak sequence being positioned so as to include at least the first codon of the transposase gene, wherein the transposase gene is modified such that a plurality of the ~~first ten~~ codons of the transposase gene that encode for amino acids 2-10 of the transposase protein are individually modified from the wild-type sequence of cytosine or guanine at the third base position of the codon to an adenine or a thymine ~~at the third base position of the codon~~, such that the modification does not change the amino acid encoded by the modified codon; and
  - b) one or more genes of interest operably-linked to one or more additional promoters, wherein the one or more genes of interest and their operably-linked promoters are flanked by insertion sequences recognized by a transposase encoded by the modified transposase gene.
2. (Previously presented) The vector of claim 1, wherein the modified transposase gene comprises the nucleic acid sequence as set forth in nucleic acids 1783 to 2987 of SEQ ID NO: 1.
3. (Previously presented) The vector of claim 1, comprising the sequence as set forth in SEQ ID NO: 1.
4. (Previously presented) The vector of claim 1, wherein the modified transposase gene encodes for a Tn10 transposase.
5. (Original) The vector of claim 1, wherein the first promoter is a constitutive promoter.

6. (Original) The vector of claim 1, wherein the first promoter is an inducible promoter.
7. (Previously presented) The vector of claim 6, wherein the inducible promoter is an ovalbumin promoter, a conalbumin promoter, or a vitellogenin promoter.
8. (Original) The vector of claim 1, wherein one gene of interest is operably-linked to a second promoter.
9. (Original) The vector of claim 8, wherein the second promoter is a constitutive promoter.
10. (Original) The vector of claim 8, wherein the second promoter is an inducible promoter.
11. (Previously presented) The vector of claim 10, wherein the inducible promoter is an ovalbumin promoter, a conalbumin promoter, or a vitellogenin promoter.
12. (Original) The vector of claim 1, further comprising a polyA sequence operably-linked to the transposase gene.
13. (Original) The vector of claim 12, wherein the polyA sequence is a conalbumin polyA sequence.
14. (Previously presented) The vector of claim 1, further comprising two stop codons operably-linked to the modified transposase gene.
15. (Original) The vector of claim 1, wherein a first gene of interest is operably-linked to a second promoter and a second gene of interest is operably-linked to a third promoter.

16. (Original) The vector of claim 1, wherein a first and a second gene of interest are operably-linked to a second promoter.

17. (Original) The vector of claim 1, further comprising an enhancer operably-linked to the one or more genes of interest.

18. (Previously presented) The vector of claim 17, wherein the enhancer comprises at least a functional portion of an ovalbumin enhancer.

19. (Currently amended) The vector of claim 1, further comprising an egg directing sequence comprising at least one of an ovalbumin signal sequence, an ovomucoid signal sequence, or a vitellogenin targeting sequence operably-linked to the one or more genes of interest.

20. (Previously presented) The vector of claim 19, wherein the egg directing sequence comprises at least one of the sequences as set forth in SEQ ID NO: 18, nucleic acids 4960-5112 of SEQ ID NO: 3, nucleic acids 4943-5092 of SEQ ID NO: 4, nucleic acids 4958-6115 of SEQ ID NO: 29, or nucleic acids 4945-6092 of SEQ ID NO: 30.

21. (Previously presented) The vector of claim 1, wherein at least one of the first promoter or the one or more additional promoters comprises at least one of the sequences as set forth in SEQ ID NO: 17, SEQ ID NO: 40, or nucleic acids 4050-4938 of SEQ ID NO: 30.

Claims 22-51 (Canceled)

52. (Currently amended) A vector comprising a nucleic acid sequence comprising:

(a) a prokaryotic transposase gene operably linked to a first promoter, wherein the nucleic acid sequence 3' to the first promoter comprises a Kozak sequence comprising the nucleotide sequence as set forth in SEQ ID NO: 13, the Kozak sequence

being positioned so as to include at least the first codon of the transposase gene, wherein the transposase gene is modified such that a plurality of the ~~first ten~~ codons of the transposase gene that encode for amino acids 2-10 of the transposase protein are individually modified from the wild-type sequence of cytosine or guanine at the third base position of the codon to an adenine or a thymine ~~at the third base position of the codon~~, such that the modification does not change the amino acid encoded by the modified codon, and wherein the modified transposase gene comprises an adenine A or a thymine T at the third position in each of codons 2-10 of the modified transposase gene;

(b) one or more genes of interest operably-linked to one or more additional promoters; and

(c) insertion sequences recognized by a transposase encoded by the modified transposase gene, wherein the transposon insertion sequences are positioned to flank the one or more genes of interest and their operably-linked promoters.

53. (Previously presented) The vector of claim 52, wherein the modified transposase gene comprises the nucleic acid sequence as set forth in nucleic acids 1783 to 2987 of SEQ ID NO: 1.

54. (Previously presented) The vector of claim 52, further comprising a polyA sequence operably-linked to the modified transposase gene.

55. (Previously presented) The vector of claim 54, wherein the polyA sequence is a conalbumin polyA sequence.

56. (Previously presented) The vector of claim 52, further comprising two stop codons operably-linked to the modified transposase gene.

57. (Previously presented) The vector of claim 52, wherein at least one of the first promoter operably linked to the modified transposase gene, or the one or more additional promoters operably-linked to the one or more genes of interest, is a vitellogenin promoter or an ovalbumin promoter.

58. (Previously presented) The vector of claim 57, further comprising a functional portion of an ovalbumin enhancer operably-linked to the one or more genes of interest.

59. (Previously presented) The vector of claim 52, further comprising an egg directing sequence comprising at least one of an ovalbumin signal sequence, an ovomucoid signal sequence, or a vitellogenin targeting sequence operably-linked to the one or more genes of interest.

60. (Previously presented) The vector of claim 59, wherein the egg directing sequence comprises at least one of the sequences as set forth in SEQ ID NO: 18, nucleic acids 4960-5112 of SEQ ID NO: 3, nucleic acids 4943-5092 of SEQ ID NO: 4, nucleic acids 4958-6115 of SEQ ID NO: 29, or nucleic acids 4945-6092 of SEQ ID NO: 30.

61. (Previously presented) The vector of claim 52, wherein at least one of the first promoter operably linked to the modified transposase gene, or the one or more additional promoters operably-linked to the one or more genes of interest, is a constitutive promoter.

62. (Previously presented) The vector of claim 52, wherein the modified transposase gene encodes for a Tn10 transposase.

63. (Currently amended) A vector comprising a nucleic acid sequence comprising:

(a) a prokaryotic transposase gene operably linked to a first promoter, wherein the nucleic acid sequence 3' to the first promoter comprises a Kozak sequence comprising the nucleotide sequence as set forth in SEQ ID NO: 13, the Kozak sequence being positioned so as to include at least the first codon of the transposase gene, wherein the transposase gene is modified such that a plurality of the ~~first ten~~ codons of the transposase gene that encode for amino acids 2-10 of the transposase protein are individually modified from the wild-type sequence of cytosine or guanine at the third base position of the codon to an adenine or a thymine ~~at the third base position of the codon~~, such that the modification does not change the amino acid encoded by the

modified codon, and wherein the modified transposase gene comprises an adenine A or a thymine T at the third position in each of codons 2-10 of the modified transposase gene;

(b) one or more genes of interest operably-linked to one or more additional promoters;

(c) insertion sequences recognized by a transposase encoded by the modified transposase gene, wherein the transposase insertion sequences are positioned to flank the one or more genes of interest and their operably-linked promoters;

(d) two stop codons operably-linked to the modified transposase gene; and

(e) a polyA sequence operably-linked to the modified transposase gene.

64. (Previously presented) The vector of claim 63, wherein at least one of the first promoter operably linked to the modified transposase gene, or the one or more additional promoters operably-linked to the one or more genes of interest, is a constitutive promoter.

65. (Previously presented) The vector of claim 63, wherein at least one of the first promoter operably linked to the modified transposase gene, or the one or more additional promoters operably-linked to the one or more genes of interest, is an inducible promoter.

66. (Previously presented) The vector of claim 65, wherein the inducible promoter is a vitellogenin promoter, a conalbumin promoter, or an ovalbumin promoter.

67. (Previously presented) The vector of claim 63, wherein the modified transposase gene comprises the nucleic acid sequence as set forth in nucleic acids 1783 to 2987 of SEQ ID NO: 1.

68. (Previously presented) The vector of claim 63, further comprising at least one egg directing sequence comprising at least one of an ovalbumin signal sequence, an ovomucoid signal sequence, or a vitellogenin targeting sequence operably-linked to the one or more genes of interest.

69. (Previously presented) The vector of claim 68, wherein the egg directing comprises at least one of the sequences as set forth in SEQ ID NO: 18, nucleic acids 4960-5112 of SEQ ID NO: 3, nucleic acids 4943-5092 of SEQ ID NO: 4, nucleic acids 4958-6115 of SEQ ID NO: 29, or nucleic acids 4945-6092 of SEQ ID NO: 30.

70. (Previously presented) The vector of claim 63, wherein the first promoter or the one or more additional promoters comprise at least one of the sequences as set forth in SEQ ID NO: 17, SEQ ID NO: 40, or nucleic acids 4050-4938 of SEQ ID NO: 30.

71. (Previously presented) The vector of claim 63, wherein the polyA sequence is a conalbumin polyA sequence.

72. (Previously presented) The vector of claim 63, wherein the modified transposase gene encodes for a Tn10 transposase.

73. (Previously presented) The vector of claim 1, wherein the gene of interest encodes for a human protein.

74. (Previously presented) The vector of claim 1, wherein the gene of interest encodes for proinsulin or human growth hormone.

75. (Previously presented) The vector of claim 74, comprising the sequence as set forth in SEQ ID NO: 31, SEQ ID NO: 32, SEQ ID NO: 41, SEQ ID NO: 42, or SEQ ID NO: 43.

76. (Previously presented) The vector of claim 52, wherein at least one of the first promoter or the one or more additional promoters comprises the sequence as set forth in SEQ ID NO: 17, SEQ ID NO: 40, or nucleic acids 4050-4938 of SEQ ID NO: 30.

77. (Previously presented) The vector of claim 63, wherein the polyA sequence comprises at least one of the sequences as set forth in SEQ ID NO: 28, SEQ ID NO: 33, or nucleic acids 2995-3410 of SEQ ID NO: 1.

78. (Previously presented) The vector of claim 18, wherein the enhancer comprises the nucleic acid sequence as set forth in SEQ ID NO: 37.

79. (Previously presented) The vector of claim 1, further comprising a TAG sequence operatively linked to at least one gene of interest, wherein the TAG sequence comprises a sequence allowing for purification of a protein encoded by the gene of interest.

80. (Previously presented) The vector of claim 79, wherein the TAG sequences comprises the nucleic acid sequence as set forth in SEQ ID NO: 22.